Pest Alert

United States
Department of
Agriculture

Forest Service

Northeastern Area
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Canker Stain Affects Delaware Sycamores

An often fatal disease of American sycamore (Platanus occidentalis), known as canker stain, is caused by the fungus, Ceratocystis fimbriata f.sp. platani. This fungus, indigenous to the United States, occurs in urban and forested areas from New Jersey to Georgia and west to Missouri and Louisiana. Other trees affected are the Oriental plane (Platanus orientalis) and London plane (Platanus acerifolia). The disease is most devastating to young trees that may die within two years after becoming infected. Older trees, such as large urban sycamores, usually die slowly over many years (Photo 1).

Photo 1. A large urban sycamore near death from canker stain.

The canker stain fungus invades the tree's stem and branch sapwood. Stored carbohydrates in the tree are used by the fungus for energy. The presence of the fungus severely disrupts water and nutrient movement and stains the sapwood a dark reddish-brown to blue or black color. Long sunken areas, called cankers, develop on the surface of stems and large branches. Cankers are often difficult to see because they are covered by overlying bark (Photo 2). Fungal-stained sapwood, often wedge-shaped, is found directly within these cankers (Photo 3).

Close-up of dead area.

Photo 2. This light colored, elongated, slightly depressed area is a canker but might be mistaken for an injury or bark deformity.

The fungus reproduces by forming several types of reproductive structures, or fruiting bodies, within the sapwood or externally on the surface of canker areas. External fruiting bodies contain thousands of microscopic slimy/sticky spores, each capable of initiating a new infection.

Photo 3. Part of a cross section from a large diseased sycamore. The fungus is seen here (dark areas with arrows) penetrating the sapwood.

During the growing season, numerous insects feed on both healthy and diseased sycamores. Common sap-feeding bark beetles are attracted to canker stain fruiting bodies on diseased sycamores. The very sticky spores contained in fruiting bodies easily become attached to a meandering beetle, or spores can even be ingested. When infested beetles travel to healthy trees to feed, they create minute wounds in the bark. These feeding wounds provide fungal spores an adequate entry into the tree. Spores, however, will germinate only in fresh wounds and do so within a few days initiating a new infection. Infectious spores can also be carried by wind-driven rain, which can be splashed onto recently made wounds.

Even though beetles and rain are sufficient means for transmission of the fungus into the tree, they are not the primary entrance methods. City street trees are often pruned or trimmed of dead or unwanted branches. Trees showing early disease progression have dead or dying branches and often become excellent candidates for major limb removal or trimming.

The very sticky spores produced by the fungus easily become attached to pruning saws, climbing ropes, wound dressings, and even stick to sawdust, work gloves, and other clothing while trees are being pruned. If these items are not disinfected following work on diseased trees, any adhering viable spores can easily become re-attached to even the smallest pruning wound made on healthy trees. It is important to note that any wound, no matter how small or large, can serve as an entry point.

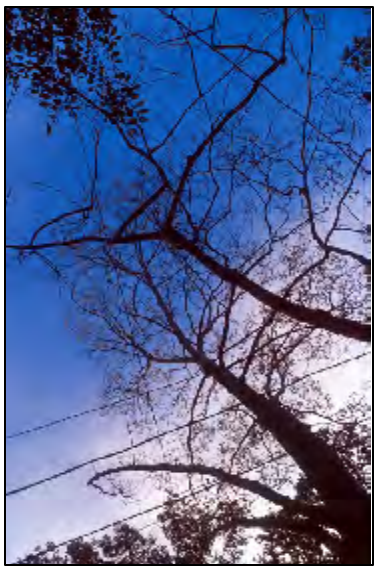

Photo 4. Dead, diseased branches become hazards, especially in urban areas.

Photo 5. Sycamores in advanced stages of disease being removed. Note thin, yellow crowns. Late August.

WHAT TO LOOK FOR:

1) sparse foliage
2) thinning crowns, sometimes dying from the top down
3) undersized wilted leaves, faded green to yellow
4) dead branches (Photo 4)
5) cankers on trunks

Symptoms, however, are not proof that the canker stain fungus is responsible. Sapwood stained samples need to be sent to a plant disease diagnostic laboratory for accurate identification and/or examined directly in the field by a plant disease specialist.

Recommendations for individual tree treatment by a plant care specialist are based on the number and amount of symptoms observed on individual trees. Usually a tree showing greater than 30 percent crown deterioration in more than one major limb is recommended for removal (Photo 5). A tree with fewer symptoms may be pruned to remove only that part of the crown affected.

WHAT YOU CAN DO:

1) Determine the risk of canker stain infection by examining nearby trees for the symptoms listed above. Compare healthy foliage to foliage affected by canker stain (Photo 6).
2) Develop a community-based plan with the help of a plant disease specialist to manage the disease and recognize when to remove or prune trees.
3) Prune trees in December and January when low temperatures and humidity repress activity of the canker stain fungus.
4) Avoid wounding exposed tree roots when mowing. Infections can initiate at the ground level from rain-carried fungal spores.
5) Do not use wound paints, even those containing fungicide, since brushes are easily contaminated with spores.

Photo 6. Canopy of a diseased tree on left with discolored sparse foliage and a healthy canopy on right. Late August.

6) Use a solution of one part household bleach (sodium hypochlorite) to nine parts water to scrub all tools (pruning saws, rope climbing gear, ladders, gloves, etc.) after trimming or removing diseased trees.

Photographs by Alan Iskra, USDA Forest Service, and Gary Schwetz, Program Manager, Delaware Center for Horticulture

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